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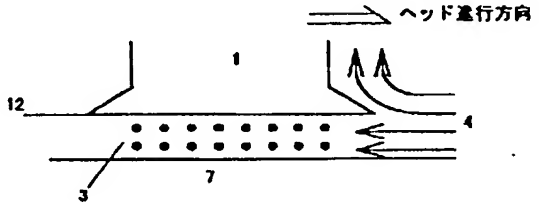
(54)【発明の名称】　インクジェット記録ヘッド

(57)【要約】
【課題】　インク滴の着弾位置の精度を向上する。
【解決手段】　記録ヘッド１の進行方向側面に突起物２を付け、その突起物の被記録体側の面をノズル面１２とほぼ同一平面とし、それと反対側の面２ａを、突起物の突出端から記録ヘッド側に向け上昇する傾斜面とする。これにより、記録ヘッド１の進行方向にともない生じる気流がノズル面と被記録体の間に入り込むことを少なくし、インク滴に対する気流の影響を小さくする。



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【特許請求の範囲】

【請求項１】　被記録体に対し相対移動しながらノズル面からインクを噴射して記録する記録ヘッドにおいて、移動の際に記録ヘッドの相対進行方向から生じる気流が前記ノズル面と被記録体の間に入り込むことをおさえるように、記録ヘッドの進行方向に突出した突起物を付けたことを特徴とするインクジェット記録ヘッド。

【請求項２】　請求項１において、前記突起物は、被記録体側の面をノズル面とほぼ同一平面とし、それと反対側の面を、突起物の突出端から記録ヘッド側に向け上昇する傾斜面としたことを特徴とするインクジェット記録ヘッド。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、インクジェット記録ヘッドに関する。

【０００２】

【従来の技術】従来、インクジェット記録装置は、図３に示すように記録ヘッド１をキャリッジ５に搭載し、図示しない駆動部によって軸６に導かれて被記録体７に沿って矢印の送り方向に移動させる。そして、記録ヘッド１で図示しない複数のノズルからインクを下方に噴射し、被記録体７に記録を行う。一行の記録が終わると被記録体７を送り、次の行の記録に移る。

【０００３】図５において、記録ヘッド１の移動によって、記録ヘッドの側面に押された気流は、記録ヘッドと被記録体の間に比較的強い気流となって入り込む。ノズル１１から速度Ｖｋで噴射されたインクは、キャリッジの移動速度及び気流速度Ｖａとの合成速度によって、被記録体７の記録点Ｋに着弾する。また、インクが噴射された後にインク滴が垂れてくることがあるが、このインク滴はほとんどが重力による落下速度Ｖｈと気流速度Ｖａによって、記録点Ｋと離れた点Ｈに飛沫となって落ちる。

【０００４】これによって、被記録体７に記録された所を拡大して見ると、図４のように予め定めた基準格子８の交点上にインクが噴射されて記録点Ｋと呼ぶ記録用の点の近くに、インクが噴射された後についてくるインク滴が記録されることがあった。

【０００５】

【発明が解決しようとする課題】噴射されたインク滴の記録点９は、上記のようにキャリッジの移動速度、噴射速度Ｖｋ、気流速度Ｖａによって決まるが、気流速度は外部からの流入もあって常に一定ではないので、記録点９は不規則になる。しかも、従来の技術は上述したように、必要としない飛沫点１０を生ずることがあり、図５に示す常に一定でない気流速度Ｖａにより記録点９と共に不規則になり、図４のように飛沫点１０が記録点９からはみ出すこともあった。

【０００６】本発明の目的は、上述した問題点を解決するためになされたものであり、記録点と飛沫点の着弾位置の精度を向上するインクジェット記録ヘッドを提供することである。

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【０００７】

【課題を解決するための手段】この目的を達成するために、請求項１の発明では、被記録体に対し相対移動しながらノズル面からインクを噴射して記録する記録ヘッドにおいて、移動の際に記録ヘッドの相対進行方向から生じる気流が前記ノズル面と被記録体の間に入り込むことをおさえるように、記録ヘッドの進行方向に突出した突起物を付けたことを特徴とする。

【０００８】請求項２では、請求項１において、前記突起物は、被記録体側の面をノズル面とほぼ同一平面とし、それと反対側の面を、突起物の突出端から記録ヘッド側に向け上昇する傾斜面としたことを特徴とする。

【０００９】この発明によれば、記録ヘッドと被記録体との相対進行により生ずる気流が記録ヘッドと被記録体の間に入り込む際、突起物によりノズル面より上部の気流は外へ流れ、噴射されたインクに当たる気流速度が小さくなり、記録点の着弾位置のずれを従来より小さくすることができる。しかも、突起物を、被記録体側の面をノズル面とほぼ同一平面とし、それと反対側の面を、突起物の突出端から記録ヘッド側に向け上昇する傾斜面とすることで、気流は効果的に上方へ逃げ、着弾位置のずれを一層小さくすることができる。

【００１０】

【発明の実施の形態】この発明の実施の形態を図１および図２に示す。

【００１１】記録ヘッド１が、図３のように、キャリッジに搭載され、インクを噴射する多数のノズル孔を有するノズル面１２を被記録体７に対向させ、被記録体７に沿って移動しながらインクを噴射して記録するのは、従来の装置と同様である。

【００１２】本実施の形態において、記録ヘッド１の被記録体側の端部に、記録ヘッドの進行方向の両側に突出した突起物２を設けている。この突起物２は、被記録体側の面をノズル面１２とほぼ同一平面とし、それと反対側の面２ａを、突起物の突出端から記録ヘッド側に向け上昇する傾斜面としている。

【００１３】このように構成することで、記録ヘッド１の進行により生ずる気流が記録ヘッドと被記録体７の間に入り込む際、突起物２によりノズル面１２より上部の気流は外へ流れ、噴射されたインクに当たる気流速度が小さくなり、記録点の着弾位置のずれを従来より小さくすることができる。しかも、突起物２は、被記録体側の面をノズル面１２とほぼ同一平面とし、それと反対側の面２ａを、突起物の突出端から記録ヘッド側に向け上昇する傾斜面とすることで、図２に示すように、気流は効果的に上方へ逃げ、インク滴に対する気流の影響を一層小さくすることができる。この結果、噴射されたインク

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MEANS

[Means for Solving the Problem] In order to attain this purpose, by invention of a claim 1, it is characterized by attaching the projection projected to the travelling direction of a recording head in the recording head which injects and records ink from a nozzle side, being displaced relatively to the recorded body so that it may press down that the air current produced from the relative travelling direction of a recording head in the case of movement enters between the aforementioned nozzle side and the recorded body.
[0008] In a claim 2, the aforementioned projection is characterized by having made mostly the field by the side of the recorded body into the same flat surface with the nozzle side, and making the field of it and an opposite side into the inclined plane which turns to a record head end and goes up from the protrusion edge of a projection in a claim 1.
[0009] In case the air current produced by relative advance with a recording head and the recorded body enters between a recording head and the recorded body according to this invention, the air speed which the air current above a nozzle side flows outside with a projection, and hits the injected ink becomes small, and can make a gap of the impact position of a recording point smaller than before. And by making mostly the field by the side of the recorded body into the same flat surface for a projection with a nozzle side, and making the field of it and an opposite side into the inclined plane which turns to a recording head side and goes up from the protrusion edge of a projection, an air current can escape upwards effectively and can make a gap of an impact position still smaller.
[0010]
[Embodiments of the Invention] The gestalt of implementation of this invention is shown in drawing 1 and drawing 2 .
[0011] the nozzle of a large number to which a recording head 1 is carried in carriage and injects ink like drawing 3 -- it is the same as that of conventional equipment to inject and record ink, making the nozzle side 12 which has a hole counter the recorded body 7, and moving in accordance with the recorded body 7
[0012] In the gestalt of this operation, the projection 2 projected on both sides of the travelling direction of a recording head is formed in the edge by the side of the recorded body of a recording head 1. This projection 2 makes mostly the field by the side of the recorded body the same flat surface with the nozzle side 12, and makes field 2a of it and an opposite side the inclined plane which turns to a record head end and goes up from the protrusion edge of a projection.
[0013] Thus, with constituting, in case the air current produced by advance of a recording head 1 enters between a recording head and the recorded body 7, the air speed which the air current above the nozzle side 12 flows outside with a projection 2, and hits the injected ink becomes small, and can make a gap of the impact position of a recording point smaller than before. And an air current can escape upwards effectively and a projection 2 can make still smaller influence of an air current to an ink drop, as shown in drawing 2 by making mostly the field by the side of the recorded body into the same flat surface with the nozzle side 12, and making field 2a of it and an opposite side into the inclined plane which turns to a recording head side and goes up from the protrusion edge of a projection. Consequently, it not only can

improve the precision of the impact position of the injected ink, but the droplet with small mass which comes about the ink can improve the precision of an impact position. With the gestalt of the above-mentioned implementation, although the recording head 1 moved in accordance with the recorded body 7, a recording head 1 is in a fixed position, and while the recorded body 7 moves, also in what carries out record operation, influence of the air current generated with movement of the recorded body 7 can be lessened with a projection 2. In this case, what is necessary is to form a projection 2 only in the recorded body move direction upstream of a recording head 1.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The perspective diagram of the gestalt of operation of this invention
[Drawing 2] The side elevation of the gestalt of operation of this invention
[Drawing 3] The perspective diagram of conventional equipment
[Drawing 4] Explanatory drawing of the surrounding situation of a recording point
[Drawing 5] The side elevation explaining the injection situation of an ink drop
[Description of Notations]
1 Recording Head
2 Projection
12 Nozzle Side

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PATENT ABSTRACTS OF JAPAN

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B41J 2/13

(21)Application number : 09-156971 (71)Applicant : BROTHER IND LTD

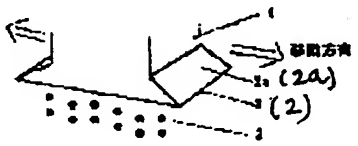
(22)Date of filing : 13.06.1997 (72)Inventor : KUBO TOMOYUKI

(54) INK JET RECORDING HEAD

(57)Abstract:

PROBLEM TO BE SOLVED: To improve accuracy of a landing position of an ink drop.

SOLUTION: A projection 2 is attached to a side face of a recording head 1 in an advancing direction and the face of the projection at a side of a recording medium is roughly flushed with a nozzle face. A face 2a at the opposite side is made to be an inclined face such that it rises toward the side of the recording head from the end of the projection. As a result, an air flow generated by virtue of the advancing of the recording head 1 hardly enters a portion between the nozzle face and recording medium, thereby reducing influence of the air flow to ink drops.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

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[Patent number]

[Date of registration]

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CLAIMS

[Claim(s)]
[Claim 1] The ink-jet recording head characterized by attaching the projection projected to the travelling direction of a recording head in the recording head which injects and records ink from a nozzle side so that it may press down that the air current produced from the relative travelling direction of a recording head in the case of movement enters between the aforementioned nozzle side and the recorded body while being displaced relatively to the recorded body.
[Claim 2] It is the ink-jet recording head characterized by considering as the inclined plane which the aforementioned projection makes mostly the field by the side of the recorded body the same flat surface with a nozzle side, turns the field of it and an opposite side to a record head end from the protrusion edge of a projection in a claim 1, and goes up.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention relates to an ink-jet recording head.
[0002]
[Description of the Prior Art] Conventionally, as shown in drawing 3 , it carries in carriage 5, and an ink-jet recording device is led to a shaft 6 by the mechanical component which is not illustrated, and moves a recording head 1 to the feed direction of an arrow in accordance with the recorded body 7 by it. And ink is caudad injected from two or more nozzles which are not illustrated by the recording head 1, and it records on the recorded body 7. After a party's record finishes, the recorded body 7 is sent and it moves to record of the following line.
[0003] In drawing 5 , by movement of a recording head 1, the air current pushed on the side of a recording head turns into a recording head and an air current comparatively strong between the recorded bodies, and enters. The ink injected at speed Vk from the nozzle 11 reaches the recording point K of the recorded body 7 by the traverse speed of carriage, and the synthesis rate with an air speed Va. Moreover, although an ink drop may hang down after ink is injected, most serves as a droplet with the fall speed Vh and the air speed Va by gravity at the recording point K and the point H which separated, and this ink drop falls.
[0004] The ink drop which comes after ink was injected near the point for record which ink is injected and is called recording point K on the intersection of the reference grid 8 beforehand defined like drawing 4 , when the place recorded on the recorded body 7 was expanded and seen by this might be recorded.
[0005]
[Problem(s) to be Solved by the Invention] By an air speed having the inflow from the outside, although the recording point 9 of the injected ink drop is decided by the traverse speed of carriage, jet velocity Vk, and the air speed Va as mentioned above, since it always is not fixed, the recording point 9 becomes irregular. And as mentioned above, the Prior art might become irregular with the recording point 9 with the air speed Va which may produce the droplet point 10 which is not needed and is shown in drawing 5 and which always is not fixed, and the droplet point 10 might protrude it from the recording point 9 like drawing 4 .
[0006] The purpose of this invention is offering the ink-jet recording head which is made in order to solve the trouble mentioned above, and improves the precision of the impact position of a recording point and a droplet point.
[0007]
[Means for Solving the Problem] In order to attain this purpose, by invention of a claim 1, it is characterized by attaching the projection projected to the travelling direction of a recording head in the recording head which injects and records ink from a nozzle side, being displaced relatively to the recorded body so that it may press down that the air current produced from the relative travelling direction of a recording head in the case of movement enters between the aforementioned nozzle side

and the recorded body.
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[0009] In case the air current produced by relative advance with a recording head and the recorded body enters between a recording head and the recorded body according to this invention, the air speed which the air current above a nozzle side flows outside with a projection, and hits the injected ink becomes small, and can make a gap of the impact position of a recording point smaller than before. And by making mostly the field by the side of the recorded body into the same flat surface for a projection with a nozzle side, and making the field of it and an opposite side into the inclined plane which turns to a recording head side and goes up from the protrusion edge of a projection, an air current can escape upwards effectively and can make a gap of an impact position still smaller.
[0010]
[Embodiments of the Invention] The gestalt of implementation of this invention is shown in drawing 1 and drawing 2 .
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[0012] In the gestalt of this operation, the projection 2 projected on both sides of the travelling direction of a recording head is formed in the edge by the side of the recorded body of a recording head 1. This projection 2 makes mostly the field by the side of the recorded body the same flat surface with the nozzle side 12, and makes field 2a of it and an opposite side the inclined plane which turns to a record head end and goes up from the protrusion edge of a projection.
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[0014]
[Effect of the Invention] Since according to this invention the air speed which enters between a recording head and the recorded body is made small and the precision of the impact position of a recording point and a droplet point can be improved, the ink-jet recording head which can make quality of record high can be offered.

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TECHNICAL FIELD

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PRIOR ART

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[0004] The ink drop which comes after ink was injected near the point for record which ink is injected and is called recording point K on the intersection of the reference grid 8 beforehand defined like drawing 4 , when the place recorded on the recorded body 7 was expanded and seen by this might be recorded.

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EFFECT OF THE INVENTION

[Effect of the Invention] Since according to this invention the air speed which enters between a recording head and the recorded body is made small and the precision of the impact position of a recording point and a splash point can be improved, the ink-jet recording head which can make quality of record high can be offered.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] By an air speed having the inflow from the outside, although the recording point 9 of the injected ink drop is decided by the traverse speed of carriage, jet velocity Vk, and the air speed Va as mentioned above, since it always is not fixed, the recording point 9 becomes irregular. And as mentioned above, the Prior art might become irregular with the recording point 9 with the air speed Va which may produce the droplet point 10 which is not needed and is shown in drawing 5 and which always is not fixed, and the droplet point 10 might protrude it from the recording point 9 like drawing 4 .
[0006] The purpose of this invention is offering the ink-jet recording head which is made in order to solve the trouble mentioned above, and improves the precision of the impact position of a recording point and a droplet point.

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